



THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kusumoto, et al.

Art Unit : 2814

Serial No. : 09/941,367

Examiner : Theresa T. Doan

Filed : August 28, 2001

Confirmation No.: 9944

Title : METHOD FOR PRODUCING INSULATED GATE THIN FILM
SEMICONDUCTOR DEVICE

MAIL STOP AF

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REPLY TO ACTION OF NOVEMBER 3, 2004

*T0
02/22/05*
In reply to the Final Office Action of November 3, 2004, Applicants submit the following remarks.

Claims 1-30 are pending, with claims 1, 2, 9, and 10 being independent. Claims 3-8, 11-16, and 21-30 were withdrawn from consideration due to a previous restriction requirement, and claims 1, 2, 9, 10, and 17-20 have been examined.

Claims 1, 2, 9, 10, and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Prior Art (APA) in view of Asano (5,409,867) and further in view of Miyao (4,599,133). Applicants respectfully traverse this rejection.

Independent claims 1, 2, and 10 recite a method for manufacturing a semiconductor device having at least one thin film transistor that includes, among other features, irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer, where the irradiation of the semiconductor layer is conducted in such a manner that the semiconductor layer is scanned with the laser beam in parallel with a carrier flow direction in the channel region.

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 2, and 10, and their dependent claims, because APA, Asano, and Miyao, either alone in combination, fail to describe or suggest irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer in such a manner that there is a relationship between the irradiating direction and the carrier flow direction. More specifically, the references fail to describe or suggest irradiating the semiconductor layer in such a manner that the semiconductor



UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Kusumoto, et al.

Art Unit : 2814

Serial No. : 09/941,367

Examiner : Theresa T. Doan

Filed : August 28, 2001

Confirmation No.: 9944

Title : METHOD FOR PRODUCING INSULATED GATE THIN FILM
SEMICONDUCTOR DEVICE

OK To ENTER

TD

MAIL STOP AF

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REPLY TO ACTION OF NOVEMBER 3, 2004

In reply to the Final Office Action of November 3, 2004, Applicants submit the following remarks.

Claims 1-30 are pending, with claims 1, 2, 9, and 10 being independent. Claims 3-8, 11-16, and 21-30 were withdrawn from consideration due to a previous restriction requirement, and claims 1, 2, 9, 10, and 17-20 have been examined.

Claims 1, 2, 9, 10, and 17-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Prior Art (APA) in view of Asano (5,409,867) and further in view of Miyao (4,599,133). Applicants respectfully traverse this rejection.

Independent claims 1, 2, and 10 recite a method for manufacturing a semiconductor device having at least one thin film transistor that includes, among other features, irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer, where the irradiation of the semiconductor layer is conducted in such a manner that the semiconductor layer is scanned with the laser beam in parallel with a carrier flow direction in the channel region.

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1, 2, and 10, and their dependent claims, because APA, Asano, and Miyao, either alone in combination, fail to describe or suggest irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer in such a manner that there is a relationship between the irradiating direction and the carrier flow direction. More specifically, the references fail to describe or suggest irradiating the semiconductor layer in such a manner that the semiconductor

layer is scanned with the laser beam in parallel with a carrier flow direction in the channel region.

As acknowledged in the Office Action, APA fails to describe or suggest scanning a semiconductor layer with a linear laser beam in parallel with a carrier flow direction in the channel region. See Office Action mailed November 3, 2004 at p. 2. Asano does not remedy this failure of APA.

Instead, Asano merely illustrates moving the substrate in one direction and, in a direction normal to the direction in which the substrate was moved, irradiating the substrate with a light beam. See Asano, Fig. 1(b) and col. 2, lines 59-68. Asano does not describe any relationship between the irradiating direction and the carrier flow direction, and Asano is unclear as to how these moving directions are related to a carrier flow direction in the channel region.

The Office Action asserts that the horizontal direction is a direction of a carrier flow, which is parallel to the direction 3 of the light beam 4. See Office Action mailed November 3, 2005 at p. 5. However, this assertion is unfounded and unsupported by the reference. Nowhere does Asano describe or illustrate that the horizontal direction is a direction of the carrier flow. The direction of arrow 3 merely illustrates the direction that substrate 1 is moved. See Asano, col. 2, lines 59-60. The direction of arrow 3 is not described or illustrated as the direction of a carrier flow. If this assertion were properly supported, then Asano would need to identify the source, drain and channel regions. It is clear from the figures that Asano does not describe or identify the locations of the source, drain, and channel regions in the crystallized region 5. Since Asano does not identify these regions, Asano cannot, and does not, describe any relationship between the irradiation direction and the carrier flow direction.

Miyao does not remedy the failure of APA and Asano with respect to these recited features and, notably, is not relied upon in the Office Action for these features.

For at least these reasons, applicants respectfully request withdrawal of the § 103(a) rejection of claims 1, 2, and 10, and their dependent claims 17-20.

Independent claim 9 recites a method for manufacturing a semiconductor device having at least one thin film transistor that includes, among other features, irradiating the semiconductor

layer with a laser beam to crystallize a semiconductor layer while moving the substrate in a direction approximately perpendicular to a lengthy direction of the linear laser beam. Applicants respectfully request reconsideration and withdrawal of the rejection because the references fail to describe or suggest irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer while moving the substrate in a direction approximately perpendicular to a lengthy direction of the linear laser beam. As discussed above with respect to claims 1, 2, and 10, Asano merely illustrates moving the substrate in one direction and, in a direction normal to the direction in which the substrate was moved, irradiating the substrate with a light beam. Asano does not describe or suggest irradiating the semiconductor layer with a laser beam to crystallize a semiconductor layer while moving the substrate in a direction approximately perpendicular to a lengthy direction of the linear laser beam.

APA and Miyao do not remedy the failure of Asano with respect to these recited features and, notably, are not relied upon in the Office Action for these features.

For at least these reasons, applicants respectfully request reconsideration and withdrawal of the rejection of claim 9 and its dependent claims.

Claims 1, 2, 9, 10, and 17-20 also stand rejected under 35 U.S.C. § 103(a) as being unpatentable over APA in view of Asano and further in view of Morita (4,468,853). Applicants respectfully request reconsideration and withdrawal of this rejection because, for the reasons discussed above, APA and Asano, either alone or in combination, fail to describe or suggest the recited features of independent claims 1, 2, 9, and 10, and because Morita does not remedy this failure of APA and Asano and, notably, is not relied upon in the Office Action for doing so. Accordingly, applicants respectfully request withdrawal of this rejection of claims 1, 2, 9, and 10, and their dependent claims 17-20.

Applicants submit that all claims are in condition for allowance.

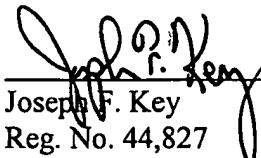
• Applicant : Kusumoto, et al.
Serial No. : 09/941,367
Filed : August 28, 2001
• Page : 4 of 4

Attorney's Docket No.: 07977-
010005 / US2941D1D1D1

No fees are believed to be due. However, during the pendency of this application, please apply any deficiencies or credits to deposit account 06-1050.

Respectfully submitted,

Date: 2/3/2005



Joseph F. Key
Reg. No. 44,827

Customer No. 26171
Fish & Richardson P.C.
1425 K Street, N.W., 11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

40264348.doc